AMENDMENTS TO THE DRAWINGS

The attached sheets for Figure 6 include references to the sequence identification numbers of the two sequences in the sequence listing submitted herewith. Attached are a marked up copy of the sheet showing the insertions of the sequence identifiers as underlined text and a replacement sheet, for replacing the originally filed sheet of Figure 6.

REMARKS

Claims 1-12 are pending in the present Application. Claims 1-12 have been amended, and claims 13-14 have been added, leaving Claims 1-14 for consideration upon entry of the present Amendment. No new matter has been introduced by these amendments.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Amendments to the Specification

The Specification has been amended to correct inadvertent typographical errors. No new matter has been introduced by these amendments.

Amendments to the Claims

Claims 1-12 have been amended to better define the invention. Support for these amendments can be found at least on page 6, line 30 – page 9, line 8, and throughout the Specification.

New Claims

Claims 13 and 14 have been added to further claim the invention.

Antecedent basis for claims 13 is found at least at page 7, lines 17-27, page 8, lines 20-33, page 10, lines 7-16, and throughout the Specification.

Antecedent basis for claims 14 is found at least at page 7, lines 17-27,, page 9, lines 9-17, page 11, lines 13-25, and throughout the Specification. Further, one of ordinary skill in the art would recognize that the computer system reading the stored data, and subsequently performing the method, could also display the resultant probe set selected in the method.

Sequence Rules Compliance

In the Office Action dated 9/28/2006, the Examiner found that the application fails to comply with the requirements of CFR 1.821 though 1.825. (Office Action dated 9/28/2006, page 2)

Attached herewith is a paper copy of the Sequence Listing, along with a text file (.txt) of the Sequence Listing to meet the requirement of a computer readable form (crf) and a Statement About

Content Of Sequence Listing Under 37 CFR 1.821(f) and (g). Applicants request entry of the Sequence Listing into the application.

Furthermore, Applicants have amended Figure 6, as well as the specification at the paragraph beginning on page 6, line 17, to include the appropriate sequence identifiers.

Applicants believe the submission of the Sequence Listing, in both paper form and computer readable form (crf) places the present application in compliance with the requirements of CFR 1.821 though 1.825.

Information Disclosure Statement

In the Office Action dated 9/28/2006, the Examiner acknowledged the Information Disclosure statements filed on May 7, 2004 and April 4, 2005. (Office Action dated 9/28/2006, page 2) The Examiner considered the IDS filed on May 7, 2004, but did not consider the IDS filed on April 4, 2005. The reason provided by the Examiner for not considering the IDS filed on April 4, 2005 was as follows: "The documents listed on the PTO-1449 filed 4/4/05 have been struck though on the form because all the documents listed therein are duplicates of the documents listed on the PTO-1449 filed 5/7/04. (Office Action dated 9/28/2006, pages 2-3)

After reviewing the two IDS's, Applicants agree that most of the documents in the IDS of April 4, 2005 were submitted previously in the IDS of May 7, 2004. However, Applicants respectfully note that the PTO-1449 filed 4/4/05 includes a nonpatent document "Office Action issued by Korean Patent Office on December 23, 2004 for the corresponding Korean patent application 10-2003-0007122" ("KPO Office Action"), submitted in Korean and in English, that was not submitted in the IDS of May 7, 2004. This document on the IDS of 4/4/05 was neither initialed nor struck through by the Examiner. Applicants respectfully request that the Examiner consider the KPO Office Action.

Objections to the Specification

The specification has been objected to because of several informalities, each addressed individually below. (Office Action dated 9/28/2006, page 3)

The specification has been objected to because '[t]he phrase "2nd" on page 1, line 30, is confusing. Is "and" intended?' (Office Action dated 9/28/2006, page 3) Applicants respectfully

submit that the specification as viewed via the Image File Wrapper in Private PAIR already has the word "and" present at page 1, line 30, and not the term "2nd".

The specification has been objected to because "[t]he phrase "...enables to construction of..." on page 1, lines 31-32 is confusing." (Office Action dated 9/28/2006, page 3) Applicants have herein amended the typographic error in the phrase on page 1, lines 31-32 to "...enables the construction of...".

The specification has been objected to because '[i]t seems the word "interest" on page 3, line 22, should be "interested."' (Office Action dated 9/28/2006, page 3) Applicants have amended the word "interest" on page 3, line 22, to the word "interested".

Applicants believe that these amendments and remarks overcome the above stated objections and respectfully request a withdrawal of the objections to the Specification.

Claim Rejections Under 35 U.S.C. § 101

The Examiner rejected claims 1-12 under 35 U.S.C. § 101 as directed to non-statutory subject matter. (Office Action dated 9/28/2006, page 3) In making the rejection, the Examiner stated that a statutory process must include a step of a physical transformation, or produce a useful, concrete, and tangible result, and that the instant claims fail to include a step of physical transformation or to produce a tangible result. In particular, the Examiner stated

> [A]t least one embodiment of the claimed invention merely manipulates data or information, calculates numbers, and results in determining locations of target genetic information. The process does not transform an article or physical object to a different state or thing outside a computation device."
>
> Furthermore, the invention does not produce a useful, concrete and tangible result. Specifically, it does not produce a tangible result. The preamble indicates the process is for designing probes using heterogeneous genetic information. However, the process steps end in determining the locations of target genetic information without using or making available for use the result of the manipulation to enable its functionality or usefulness to be realized.

(Office Action dated 9/28/2006, page 3)

As amended, independent Claims 1 and 7 are directed to a system and method for determining a location of a target sequence in a genome sequence.

Claim 1, directed to the system, comprises a storage unit storing a crosslink map, wherein the crosslink map comprises a record for a sequence information for each version of a genome

sequence comprising the sequence information; an information search unit, for searching for identifier information and sequence information corresponding to a target sequence among the records in the crosslink map; and a location estimation unit, for determining a reference group comprising reference sequence information for an organism, wherein the reference sequence information is represented in the crosslink map by more than a predetermined number of records, calculating a difference value of a start position and an end position of a reference sequence information obtained from the crosslink map, and determining a location of the target sequence in a genome sequence by a location shift corresponding to the difference value. Thus the system of claims 1-6 is clearly directed to statutory subject matter, i.e., an apparatus. The apparatus (system) comprises a storage unit, an information search unit, and a location estimation unit.

The method of claims 7-11 produces a useful, concrete and tangible result. The method of the invention does not merely manipulate abstract concepts or ideas without some practical application.

In State Street Bank & Trust Co. v. Signature Financial Group Inc. (149 F. 3d 1368; 47 USPQ2d 1596 (Fed. Cir. 1998)), data representing discrete dollar amounts were mathematically converted into a final share price. The method of claims 7-11 is similarly a practical application of an algorithm in the technological arts.

In the method of Claim 7, a target sequence, representing a nucleic acid, is an input. Performing the method of independent Claim 7 then provides the useful, concrete and tangible result of the location of the target sequence in a genome sequence. The location of a target sequence in a genome sequence is useful because it can then be used to predict probe characteristics, such as, for example, hybridization potential, which is useful in the design and selection of nucleic acid probes. Since the claimed method is a practical application within the technological arts and further since the claimed method produces a useful, concrete, and tangible result, Applicants believe that amended Claims 7-11 are directed to statutory subject matter.

In addition, Claim 12 is rejected as being drawn to non-statutory subject matter as being drawn to a signal, i.e., a non-statutory natural phenomena. (Office Action dated 9/28/2006, page 4) The Examiner states that since the specification defines "computer readable medium" as including "carrier waves", Claim 12 is therefore non-statutory for being drawn to a signal, i.e., a non-statutory natural phenomena. (Office Action dated 9/28/2006, page 4) Although Applicants disagree with

this interpretation, in order to further prosecution, Claim 12 has been amended to include the phrase "wherein the computer readable medium is not a carrier wave." Applicants believe Claim 12, as amended, overcomes the rejection and is directed to statutory subject matter and therefore meets the requirements of 35 U.S.C. § 101.

Applicants respectfully request reconsideration and withdrawal of the rejection of Claims 1-12 under 35 U.S.C. 101.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1-12 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office Action dated 9/28/2006, page 6) In particular, the Examiner states that the claims appear to be drawn to a method or system or computer program for "designing a probes [sic] using heterogeneous genetic information" however the method steps end with "determining the location of the target genetic information" (claim 7) and never accomplish "designing of probes". (Office Action dated 9/28/2006, page 6) Further the Examiner stated that the phrase "the version of the genome sequence" recited in claims 1, 7 and 12 lacks clear antecedent basis and is confusing. (Office Action dated 9/28/2006, page 6) Additionally, the Examiner stated that the phrase "the genome sequence in the crosslink map" in claim 1 lacks clear antecedent basis and that the metes and bounds of the limitation "difference values of the start positions and end positions of the reference genetic information based on the crosslink map" recited in claims 1, 7 and 12 are not clear. (Office Action dated 9/28/2006, page 7) Similarly, the metes and bounds of the phrase in claims 1 and 5, "the latest genome sequence" are stated to not be clear. (Office Action dated 9/28/2006, page 7) Further, the phrase "the genome sequence" in claims 2 and 3 is stated to lack antecedent basis and the phrase "in amore number in an organism" in claim 4 is stated to be confusing and unclear. (Office Action dated 9/28/2006, page 7)

Claims 1-12 have been amended to better define the invention. In particular, Claims 1 is directed to "a system for determining the location of a target sequence in a genome sequence. Claim 7 is directed to a method of determining the location of a target sequence in a genome sequence. Applicants believe that Claims 1-12, as amended overcome the rejection under 35 U.S.C. § 112, second paragraph.

Further, with regard to the phrase "the version of the genome sequence", Applicants submit

that the Specification teaches that the crosslink map is created in the form of a table that defines the interrelationship among versions of a genome sequence from different sources or updated at different times (p. 2, lines 4-8) using various identifier information. For example, with respect to genome version 1.0 and genome version 2.0, the crosslink map stores cross-referable information based on the location information of identifiers between two genome versions, such as protein, coding sequence (CDS), exon/intron, regulatory region, mRNA, sequence tagged site (STS), expressed sequence tag (EST), and contig sequence. (page 6, line 30 – page 7, line3) Thus, one of ordinary skill in the art would recognize that the crosslink map is provided to define the relationships between different versions of a genome sequence. Further, one of ordinary skill in the art would recognize that the version of a genome sequence may be derived from published or unpublished versions of genome sequences, as well as, complete or incomplete versions of genome sequences.

Additionally, Claims 1 and 7 have been amended to include the phrase "difference value of a start position and an end position of a reference sequence information obtained from the crosslink map". As disclosed in the Specification, a start position and an end position are determined in context of identifiers between the two genome versions, such as protein, coding sequence (CDS), exon/intron, regulatory region, mRNA, sequence tagged site (STS), expressed sequence tag (EST), and contig sequence. (page 11, lines 6-31)

In summary, Applicants respectfully submit that Claims 1-12, as presently amended, meet the requirements of 35 U.S.C. § 112, second paragraph. Applicants therefore respectfully request a withdrawal of the 35 U.S.C. § 112 rejection.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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By_____

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